CLAIMS

What is claimed is:

1. A method for providing computer understanding by generating computer instructions from a natural language dialog, comprising:

5   receiving a symbolic representation of a natural language utterance;

determining, by accessing a context sensitive system dictionary for a subject area, a subject area identifier based upon parsing the symbolic representation, the parsing producing parsed information;

determining, by accessing a context sensitive system subdictionary for a

10 program module of the subject area, a module identifier based upon the determined subject area identifier and the parsed information;

determining, by accessing a context sensitive system subdictionary for an argument of the program module, an argument identifier based upon the determined module identifier and the parsed information;

15   determining, by accessing a context sensitive system subdictionary for a value of the argument, a value identifier based upon the determined argument identifier and the parsed information; and

producing computer instructions based upon the subject area identifier, module, the module identifier, the argument identifier and the value identifier,

20 such that the natural language utterance is processed by the computer.

2. The method of Claim 1 wherein the context sensitive system dictionary for the subject area further comprises a context sensitive system subdictionary for a sub-subject area.

3. The method of Claim 1 wherein

25   determining a value identifier further comprises querying the computer

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system for a missing value identifier.

4. The method of Claim 1 wherein

    determining a subject area identifier further comprises querying a user of the computer system for a missing subject area identifier;

5   determining a module identifier further comprises querying a user of the computer system for a missing module identifier; and

    determining a value identifier further comprises querying a user of the computer system for a missing value identifier.

5. The method of Claim 1 wherein

10 determining a subject area identifier further comprises using a previously determined value for a missing subject area identifier;

    determining a module identifier further comprises using a previously determined value for a missing module identifier; and

    determining a value identifier further comprises using a previously

15 determined value for a missing value identifier.

6. A method for determining an appropriate program module selection for processing a natural language dialog in a computer system for processing natural language, comprising:

    capturing a set of successfully understood natural language dialogs and

20 associated program modules used to produce computer understanding;

    analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;

    storing the frequency of occurrence values in a matrix; and

25 determining, using the matrix, the appropriate program module selection based on choosing program modules having non-zero frequency value entries in

the matrix.

7.   The method for Claim 6 further comprising:

        capturing a step associated with the program modules as executed within the natural language dialogs;

5   analyzing the captured program module information to determine a frequency of occurrence value, for each of the steps in the dialog, for proceeding to a next program module from a current program module;

        storing the frequency of occurrence values and step information in a matrix; and

10   determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero frequency value entries in the matrix.

8.   The method for Claim 6 further comprising:

        capturing grouping information for the program modules as executed

15   within the natural language dialogs;

        analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;

        storing the frequency of occurrence values and the grouping information

20   in a matrix; and

        determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.

9.   An apparatus providing computer understanding by generating computer

25   instructions from a natural language dialog, comprising:

        a receiver receiving a symbolic representation of a natural language

utterance;

a context sensitive subject area system dictionary used to determine a subject area identifier based upon parsing the symbolic representation, the parsing producing parsed information;

a context sensitive system program module subdictionary used to determine a module identifier based upon the determined subject area identifier and the parsed information;

a context sensitive argument system subdictionary used to determine an argument identifier based upon the determined module identifier and the parsed information;

a context sensitive value system subdictionary used to determine a value identifier based upon the determined argument identifier and the parsed information; and

computer instructions produced based upon the subject area identifier, module, the module identifier, the argument identifier and the value identifier, such that the natural language utterance is processed by the computer.

10. The apparatus of Claim 9 wherein the context sensitive system dictionary for the subject area further comprises a context sensitive system subdictionary for a sub-subject area.

11. The apparatus of Claim 9 wherein undetermined value identifiers are determined by querying the computer system for a missing value identifier.

12. The apparatus of Claim 9 wherein:

undetermined subject area identifiers are determined by querying a user of the computer system for a missing subject area identifier;

undetermined module identifiers are determined by querying a user of the computer system for a missing module identifier; and

undetermined value identifiers are determined by querying a user of the computer system for a missing value identifier.

13. The apparatus of Claim 9 wherein

undetermined subject area identifiers are determined using a previously

5   determined value for a missing subject area identifier;

undetermined module identifiers are determined using a previously determined value for a missing module identifier; and

undetermined value identifiers are determined using a previously determined value for a missing value identifier.

10 14. An apparatus determining an appropriate program module selection for processing a natural language dialog in a computer system for processing natural language, comprising:

a set of successfully understood natural language dialogs and associated program modules used to produce computer understanding;

15   an analyzer analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values; and

a logic unit determining, using the matrix, the appropriate program

20   module selection based on choosing program modules having non-zero frequency value entries in the matrix.

15. The apparatus of Claim 14 further comprising:

a step identifier, associated with the program modules as executed within the natural language dialogs;

25   an analyzer analyzing the captured program module information to determine a frequency of occurrence value, for each of the steps identified in the

dialog, for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values and step information; and

5   a logic unit determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero frequency value entries in the matrix.

16.   The apparatus of Claim 14 further comprising:

a grouping identifier for the program modules as executed within the
10   natural language dialogs;

an analyzer analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values and the grouping
15   information; and

a logic unit determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.

17.   An apparatus for providing computer understanding by generating computer
20   instructions from a natural language dialog, comprising:

a means for receiving a symbolic representation of a natural language utterance;

a means for determining, by accessing a context sensitive system dictionary for a subject area, a subject area identifier based upon parsing the
25   symbolic representation, the parsing producing parsed information;

a means for determining, by accessing a context sensitive system subdictionary for a program module of the subject area, a module identifier

based upon the determined subject area identifier and the parsed information;

a means for determining, by accessing a context sensitive system subdictionary for an argument of the program module, an argument identifier based upon the determined module identifier and the parsed information;

5   a means for determining, by accessing a context sensitive system subdictionary for a value of the argument, a value identifier based upon the determined argument identifier and the parsed information; and

a means for producing computer instructions based upon the subject area identifier, module, the module identifier, the argument identifier and the value

10   identifier, such that the natural language utterance is processed by the computer.

18.   A computer program product comprising:

a computer usable medium for providing computer understanding by generating computer instructions from a natural language dialog;

a set of computer program instructions embodied on the computer usable

15   medium, including instructions to:

receive a symbolic representation of a natural language utterance;

determine, by accessing a context sensitive system dictionary for a subject area, a subject area identifier based upon parsing the symbolic representation, the parsing producing parsed information;

20   determine, by accessing a context sensitive system subdictionary for a program module of the subject area, a module identifier based upon the determined subject area identifier and the parsed information;

determine, by accessing a context sensitive system subdictionary for an argument of the program module, an argument identifier based upon the

25   determined module identifier and the parsed information;

determine, by accessing a context sensitive system subdictionary for a value of the argument, a value identifier based upon the determined argument identifier and the parsed information; and

produce computer instructions based upon the subject area identifier,
module, the module identifier, the argument identifier and the value identifier,
such that the natural language utterance is processed by the computer.

19.   A computer data signal embodied in a carrier wave comprising a code segment
5   for providing computer understanding by generating computer instructions from
a natural language dialog, the code segment including instructions to:

receive a symbolic representation of a natural language utterance;

determine, by accessing a context sensitive system dictionary for a
subject area, a subject area identifier based upon parsing the symbolic
10   representation, the parsing producing parsed information;

determine, by accessing a context sensitive system subdictionary for a
program module of the subject area, a module identifier based upon the
determined subject area identifier and the parsed information;

determine, by accessing a context sensitive system subdictionary for an
15   argument of the program module, an argument identifier based upon the
determined module identifier and the parsed information;

determine, by accessing a context sensitive system subdictionary for a
value of the argument, a value identifier based upon the determined argument
identifier and the parsed information; and

20   produce computer instructions based upon the subject area identifier,
module, the module identifier, the argument identifier and the value identifier,
such that the natural language utterance is processed by the computer.